



10830118.txt  
SEQUENCE LISTING

<110> GUERIN-MARCHAND, CLAUDINE  
DRUILHE, PIERRE

<120> DNA SEQUENCES ENCODING PEPTIDE SEQUENCES SPECIFIC FOR  
THE HEPATIC STAGES OF *P. FALCIPARUM* BEARING EPITOPES  
CAPABLE OF STIMULATING THE T LYMPHOCYTES (as amended)

<130> 010830-118

<140> 09/900,963  
<141> 2001-07-10

<150> 08/098,327  
<151> 1993-11-24

<150> PCT/FR92/00104  
<151> 1992-02-05

<150> FR 91 01286  
<151> 1991-02-05

<160> 47

<170> PatentIn ver. 3.3

<210> 1  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula  
Sequence

<220>  
<221> MOD\_RES  
<222> (8)  
<223> Glu or Gly

<400> 1  
Leu Ala Lys Glu Lys Leu Gln Xaa Gln Gln Ser Asp Leu Glu Gln Glu  
1 5 10 15

Arg

<210> 2  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula  
Sequence

<220>  
<221> MOD\_RES  
<222> (1)  
<223> Ser or Arg

10830118.txt

<220>  
<221> MOD\_RES  
<222> (6)  
<223> Glu or Asp

<220>  
<221> MOD\_RES  
<222> (8)  
<223> Arg or Leu

<220>  
<221> MOD\_RES  
<222> (15)  
<223> Glu or Gly

<400> 2  
Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln  
1 5 10 15  
Gln

<210> 3  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula  
Sequence

<220>  
<221> MOD\_RES  
<222> (2)  
<223> Ser or Arg

<220>  
<221> MOD\_RES  
<222> (7)  
<223> Glu or Asp

<220>  
<221> MOD\_RES  
<222> (9)  
<223> Arg or Leu

<220>  
<221> MOD\_RES  
<222> (16)  
<223> Glu or Gly

<400> 3  
Gln Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa  
1 5 10 15  
Gln

<210> 4  
<211> 17  
<212> PRT  
<213> Artificial Sequence

10830118.txt

<220>  
<223> Description of Artificial Sequence: Synthetic Formula Sequence

<220>  
<221> MOD\_RES  
<222> (3)  
<223> Ser or Arg

<220>  
<221> MOD\_RES  
<222> (8)  
<223> Glu or Asp

<220>  
<221> MOD\_RES  
<222> (10)  
<223> Arg or Leu

<220>  
<221> MOD\_RES  
<222> (17)  
<223> Glu or Gly

<400> 4  
Gln Gln Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln  
1 5 10 15

Xaa

<210> 5  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula Sequence

<220>  
<221> MOD\_RES  
<222> (1)  
<223> Glu or Gly

<220>  
<221> MOD\_RES  
<222> (4)  
<223> Ser or Arg

<220>  
<221> MOD\_RES  
<222> (9)  
<223> Glu or Asp

<220>  
<221> MOD\_RES  
<222> (11)  
<223> Arg or Leu

<400> 5  
Xaa Gln Gln Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu  
1 5 10 15

Gln

<210> 6  
<211> 17

<212> PRT

<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula Sequence

<220>  
<221> MOD\_RES  
<222> (2)  
<223> Glu or Gly

<220>  
<221> MOD\_RES  
<222> (5)  
<223> Ser or Arg

<220>  
<221> MOD\_RES  
<222> (10)  
<223> Glu or Asp

<220>  
<221> MOD\_RES  
<222> (12)  
<223> Arg or Leu

<400> 6  
Gln xaa Gln Gln xaa Asp Leu Glu Gln xaa Arg Xaa Ala Lys Glu Lys  
1 5 10 15

Leu

<210> 7  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula Sequence

<220>  
<221> MOD\_RES  
<222> (3)  
<223> Glu or Gly

<220>  
<221> MOD\_RES  
<222> (6)  
<223> Ser or Arg

<220>  
<221> MOD\_RES  
<222> (11)  
<223> Glu or Asp

10830118.txt

<220>

<221> MOD\_RES

<222> (13)

<223> Arg or Leu

<400> 7

Leu Gln Xaa Gln Gln Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala Lys Glu

1

5

10

15

Lys

<210> 8

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Formula Sequence

<220>

<221> MOD\_RES

<222> (4)

<223> Glu or Gly

<220>

<221> MOD\_RES

<222> (7)

<223> Ser or Arg

<220>

<221> MOD\_RES

<222> (12)

<223> Glu or Asp

<220>

<221> MOD\_RES

<222> (14)

<223> Arg or Leu

<400> 8

Lys Leu Gln Xaa Gln Gln Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala Lys

1

5

10

15

Glu

<210> 9

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Formula Sequence

<220>

<221> MOD\_RES

<222> (5)

<223> Glu or Gly

10830118.txt

<220>  
<221> MOD\_RES  
<222> (8)  
<223> Ser or Arg

<220>  
<221> MOD\_RES  
<222> (13)  
<223> Glu or Asp

<220>  
<221> MOD\_RES  
<222> (15)  
<223> Arg or Leu

<400> 9  
Glu Lys Leu Gln Xaa Gln Gln Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala  
1 5 10 15

Lys

<210> 10  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula  
Sequence

<220>  
<221> MOD\_RES  
<222> (6)  
<223> Glu or Gly

<220>  
<221> MOD\_RES  
<222> (9)  
<223> Ser or Arg

<220>  
<221> MOD\_RES  
<222> (14)  
<223> Glu or Asp

<220>  
<221> MOD\_RES  
<222> (16)  
<223> Arg or Leu

<400> 10  
Lys Glu Lys Leu Gln Xaa Gln Gln Xaa Asp Leu Glu Gln Xaa Arg Xaa  
1 5 10 15

Ala

<210> 11  
<211> 17  
<212> PRT  
<213> Artificial Sequence

10830118.txt

<220>  
<223> Description of Artificial Sequence: Synthetic Formula  
Sequence

<220>  
<221> MOD\_RES  
<222> (7)  
<223> Glu or Gly

<220>  
<221> MOD\_RES  
<222> (10)  
<223> Ser or Arg

<220>  
<221> MOD\_RES  
<222> (15)  
<223> Glu or Asp

<220>  
<221> MOD\_RES  
<222> (17)  
<223> Arg or Leu

<400> 11  
Ala Lys Glu Lys Leu Gln Xaa Gln Gln Xaa Asp Leu Glu Gln Xaa Arg  
1 5 10 15

Xaa

<210> 12  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula  
Sequence

<220>  
<221> MOD\_RES  
<222> (1)  
<223> Arg or Leu

<220>  
<221> MOD\_RES  
<222> (8)  
<223> Glu or Gly

<220>  
<221> MOD\_RES  
<222> (11)  
<223> Ser or Arg

<220>  
<221> MOD\_RES  
<222> (16)  
<223> Glu or Asp

<400> 12  
Xaa Ala Lys Glu Lys Leu Gln Xaa Gln Gln Xaa Asp Leu Glu Gln Xaa  
1 5 10 15

10830118.txt

Arg

<210> 13  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula Sequence

<220>  
<221> MOD\_RES  
<222> (2)  
<223> Arg or Leu

<220>  
<221> MOD\_RES  
<222> (9)  
<223> Glu or Gly

<220>  
<221> MOD\_RES  
<222> (12)  
<223> Ser or Arg

<220>  
<221> MOD\_RES  
<222> (17)  
<223> Glu or Asp

<400> 13  
Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln Gln Xaa Asp Leu Glu Gln  
1 5 10 15

Xaa

<210> 14  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula Sequence

<220>  
<221> MOD\_RES  
<222> (1)  
<223> Glu or Asp

<220>  
<221> MOD\_RES  
<222> (3)  
<223> Arg or Leu

<220>  
<221> MOD\_RES  
<222> (10)  
<223> Glu or Gly

10830118.txt

<220>  
<221> MOD\_RES  
<222> (13)  
<223> Ser or Arg

<400> 14  
Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln Gln Xaa Asp Leu Glu  
1 5 10 15

Gln

<210> 15  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula Sequence

<220>  
<221> MOD\_RES  
<222> (2)  
<223> Glu or Asp

<220>  
<221> MOD\_RES  
<222> (4)  
<223> Arg or Leu

<220>  
<221> MOD\_RES  
<222> (11)  
<223> Glu or Gly

<220>  
<221> MOD\_RES  
<222> (14)  
<223> Ser or Arg

<400> 15  
Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln Gln Xaa Asp Leu  
1 5 10 15

Glu

<210> 16  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula Sequence

<220>  
<221> MOD\_RES  
<222> (3)  
<223> Glu or Asp

10830118.txt

<220>  
<221> MOD\_RES  
<222> (5)  
<223> Arg or Leu

<220>  
<221> MOD\_RES  
<222> (12)  
<223> Glu or Gly

<220>  
<221> MOD\_RES  
<222> (15)  
<223> Ser or Arg

<400> 16  
Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln Gln Xaa Asp  
1 5 10 15

Leu

<210> 17  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Formula  
Sequence

<220>  
<221> MOD\_RES  
<222> (4)  
<223> Glu or Asp

<220>  
<221> MOD\_RES  
<222> (6)  
<223> Arg or Leu

<220>  
<221> MOD\_RES  
<222> (13)  
<223> Glu or Gly

<220>  
<221> MOD\_RES  
<222> (16)  
<223> Ser or Arg

<400> 17  
Leu Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln Gln Xaa  
1 5 10 15

Asp

<210> 18  
<211> 17  
<212> PRT  
<213> Artificial Sequence

10830118.txt

<220>  
<223> Description of Artificial Sequence: Synthetic Formula  
Sequence

<220>  
<221> MOD\_RES  
<222> (5)  
<223> Glu or Asp

<220>  
<221> MOD\_RES  
<222> (7)  
<223> Arg or Leu

<220>  
<221> MOD\_RES  
<222> (14)  
<223> Glu or Gly

<220>  
<221> MOD\_RES  
<222> (17)  
<223> Ser or Arg

<400> 18  
Asp Leu Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln Gln  
1 5 10 15

Xaa

<210> 19  
<211> 107  
<212> PRT  
<213> Plasmodium falciparum

<400> 19  
Arg Lys Ala Asp Thr Lys Lys Asn Leu Glu Arg Lys Lys Glu His Gly  
1 5 10 15

Asp Ile Leu Ala Glu Asp Leu Tyr Gly Arg Leu Glu Ile Pro Ala Ile  
20 25 30

Glu Leu Pro Ser Glu Asn Glu Arg Gly Tyr Tyr Ile Pro His Gln Ser  
35 40 45

Ser Leu Pro Gln Asp Asn Arg Gly Asn Ser Arg Asp Ser Lys Glu Ile  
50 55 60

Ser Ile Ile Glu Lys Thr Asn Arg Glu Ser Ile Thr Thr Asn Val Glu  
65 70 75 80

Gly Arg Arg Asp Ile His Lys Gly His Leu Glu Glu Lys Lys Asp Gly  
85 90 95

Ser Ile Lys Pro Glu Gln Lys Glu Asp Lys Ser  
100 105

<210> 20  
<211> 117  
<212> PRT  
<213> Plasmodium falciparum

10830118.txt

<400> 20  
Leu Gln Glu Glu Gln Gln Arg Asp Leu Glu Gln Arg Lys Ala Asp Thr Lys  
1 5 10 15  
Lys Asn Leu Glu Arg Lys Lys Glu His Gly Asp Ile Leu Ala Glu Asp  
20 25 30  
Leu Tyr Gly Arg Leu Glu Ile Pro Ala Ile Glu Leu Pro Ser Glu Asn  
35 40 45  
Glu Arg Gly Tyr Tyr Ile Pro His Gln Ser Ser Leu Pro Gln Asp Asn  
50 55 60  
Arg Gly Asn Ser Arg Asp Ser Lys Glu Ile Ser Ile Ile Glu Lys Thr  
65 70 75 80  
Asn Arg Glu Ser Ile Thr Thr Asn Val Glu Gly Arg Arg Asp Ile His  
85 90 95  
Lys Gly His Leu Glu Glu Lys Lys Asp Gly Ser Ile Lys Pro Glu Gln  
100 105 110  
Lys Glu Asp Lys Ser  
115

<210> 21  
<211> 27  
<212> PRT  
<213> Plasmodium falciparum

<400> 21  
Asp Thr Lys Lys Asn Leu Glu Arg Lys Lys Glu His Gly Asp Ile Leu  
1 5 10 15  
Ala Glu Asp Leu Tyr Gly Arg Leu Glu Ile Pro  
20 25

<210> 22  
<211> 24  
<212> PRT  
<213> Plasmodium falciparum

<400> 22  
Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Arg Asp Leu Glu  
1 5 10 15  
Gln Arg Lys Ala Asp Thr Lys Lys  
20

<210> 23  
<211> 31  
<212> PRT  
<213> Plasmodium falciparum

<400> 23  
Asn Ser Arg Asp Ser Lys Glu Ile Ser Ile Ile Glu Lys Thr Asn Arg  
1 5 10 15  
Glu Ser Ile Thr Thr Asn Val Glu Gly Arg Arg Asp Ile His Lys  
Page 12

20

25 10830118.txt

30

<210> 24  
<211> 151  
<212> PRT  
<213> Plasmodium falciparum

<400> 24  
Arg Asp Glu Leu Phe Asn Glu Leu Leu Asn Ser Val Asp Val Asn Gly  
1 5 10 15  
Glu Val Lys Glu Asn Ile Leu Glu Glu Ser Gln Val Asn Asp Asp Ile  
20 25 30  
Phe Asn Ser Leu Val Lys Ser Val Gln Gln Glu Gln Gln His Asn Val  
35 40 45  
Glu Glu Lys Val Glu Glu Ser Val Glu Glu Asn Asp Glu Glu Ser Val  
50 55 60  
Glu Glu Asn Val Glu Glu Asn Val Glu Glu Asn Asp Asp Gly Ser Val  
65 70 75 80  
Ala Ser Ser Val Glu Glu Ser Ile Ala Ser Ser Val Asp Glu Ser Ile  
85 90 95  
Asp Ser Ser Ile Glu Glu Asn Val Ala Pro Thr Val Glu Glu Ile Val  
100 105 110  
Ala Pro Thr Val Glu Glu Ile Val Ala Pro Ser Val Val Glu Lys Cys  
115 120 125  
Ala Pro Ser Val Glu Glu Ser Val Ala Pro Ser Val Glu Glu Ser Val  
130 135 140  
Ala Glu Met Leu Lys Glu Arg  
145 150

<210> 25  
<211> 47  
<212> PRT  
<213> Plasmodium falciparum

<400> 25  
Arg Asp Glu Leu Phe Asn Glu Leu Leu Asn Ser Val Asp Val Asn Gly  
1 5 10 15  
Glu Val Lys Glu Asn Ile Leu Glu Glu Ser Gln Val Asn Asp Asp Ile  
20 25 30  
Phe Asn Ser Leu Val Lys Ser Val Gln Gln Glu Gln Gln His Asn  
35 40 45

<210> 26  
<211> 26  
<212> PRT  
<213> Plasmodium falciparum

<400> 26  
Asp Glu Leu Phe Asn Glu Leu Leu Asn Ser Val Asp Val Asn Gly Glu  
Page 13

10830118.txt  
1 5 10 15

Val Lys Glu Asn Ile Leu Glu Glu Ser Gln  
20 25

<210> 27  
<211> 27  
<212> PRT  
<213> Plasmodium falciparum

<400> 27  
Leu Glu Glu Ser Gln Val Asn Asp Asp Ile Phe Ser Asn Ser Leu Val  
1 5 10 15

Lys Ser Val Gln Gln Glu Gln Gln His Asn Val  
20 25

<210> 28  
<211> 27  
<212> PRT  
<213> Plasmodium falciparum

<400> 28  
Val Glu Lys Cys Ala Pro Ser Val Glu Glu Ser Val Ala Pro Ser Val  
1 5 10 15

Glu Glu Ser Val Ala Glu Met Leu Lys Glu Arg  
20 25

<210> 29  
<211> 17  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Primer

<400> 29  
ttgttctaga tcgcttt 17

<210> 30  
<211> 15  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Primer

<400> 30  
aaagaagata aatct 15

<210> 31  
<211> 316  
<212> PRT  
<213> Plasmodium falciparum

<400> 31  
Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln  
1 5 10 15

10830118.txt

Gln Ser Asp Leu Glu Gln Asp Arg Leu Ala Lys Glu Lys Leu Gln Glu  
20 25 30

Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys Glu Lys Leu Gln  
35 40 45

Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu  
50 55 60

Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys  
65 70 75 80

Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg Leu Ala Lys Glu  
85 90 95

Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys  
100 105 110

Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala  
115 120 125

Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu  
130 135 140

Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg  
145 150 155 160

Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu  
165 170 175

Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln  
180 185 190

Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Arg Asp Leu Glu  
195 200 205

Gln Arg Lys Ala Asp Thr Lys Lys Asn Leu Glu Arg Lys Lys Glu His  
210 215 220

Gly Asp Ile Leu Ala Glu Asp Leu Tyr Gly Arg Leu Glu Ile Pro Ala  
225 230 235 240

Ile Glu Leu Pro Ser Glu Asn Glu Arg Gly Tyr Tyr Ile Pro His Gln  
245 250 255

Ser Ser Leu Pro Gln Asp Asn Arg Gly Asn Ser Arg Asp Ser Lys Glu  
260 265 270

Ile Ser Ile Ile Glu Lys Thr Asn Arg Glu Ser Ile Thr Thr Asn Val  
275 280 285

Glu Gly Arg Arg Asp Ile His Lys Gly His Leu Glu Glu Lys Lys Asp  
290 295 300

Gly Ser Ile Lys Pro Glu Gln Lys Glu Asp Lys Ser  
305 310 315

<210> 32  
<211> 950  
<212> DNA  
<213> Plasmodium falciparum

10830118.txt

<400> 32

aaagcgatct	agaacaagag	agacgtgcta	aagaaaagtt	gcaagaacaa	caaagcgatt	60
tagaacaaga	tagacttgct	aaagaaaaagt	tacaagagca	gcaaaagcgt	ttagaacaag	120
agagacttgc	taaagaaaaag	ttgcaagaac	aacaaagcga	tctagaacaa	gagagacgtg	180
ctaaagaaaa	gttgcagaaa	caacaaagcg	atttagaaca	agagagacgt	gctaaagaaa	240
agttgcaga	acaacaaagc	gatttagaac	aagatagact	tgctaaagaa	aagttacaag	300
agcagcaaag	cgtttagaa	caagagagac	gtgctaaagaa	aaagttgcaa	gaacaacaaa	360
gcgatttaga	acaagagaga	cgtgctaaag	aaaagttgca	agaacaacaa	agcgatttag	420
aacaagagag	acttgctaaa	gaaaagttgc	aagaacaaca	aagcgattta	gaacaagaga	480
gacgtgctaa	agaaaaagtt	caagaacaac	aaagcgattt	agacaagag	agacgtgcta	540
aagaaaagtt	gcaagaacaa	caaagcgatt	tagacaaga	gagacgtgct	aaagaaaaagt	600
tgcaagagca	gcaaaagagat	tttagaacaa	ggaaggctga	tacaaaaaaaa	aatttagaaa	660
gaaaaaagga	acatggagat	atattagcag	aggattata	tggtcgttta	gaaataccag	720
ctatagaact	tccatcagaa	aatgaacgt	gatattata	accacatcaa	tcttctttac	780
ctcaggacaa	cagagggaaat	agtagagatt	ccaaggaaat	atctataata	gaaaaaacaa	840
atagagaatc	tattacaaca	aatgttgaag	gacgaagggaa	tatacataaa	ggacatcttg	900
aagaaaagaa	agatggttca	ataaaaccag	aacaaaaaaga	agataaatct		950

<210> 33

<211> 464

<212> DNA

<213> Plasmodium falciparum

<400> 33

gaattccgt	atgaactttt	taatgaatta	ttaaatagtg	tagatgttaa	tggagaagta	60
aaagaaaata	ttttggagga	aagtcaagtt	aatgaggata	ttttaatag	tttagtaaaa	120
agtgttcaac	agaacaaca	acacaatgtt	gaagaaaaag	ttgaagaaag	tgtagaagaa	180
aatgacaag	aaagtgttaga	agaaaaatgt	gaagaaaaat	tagaagaaaa	tgacgacgga	240
agtgtagct	caagtgttga	agaaaatgt	gcttcaagt	ttgatgaaag	tatagattca	300
agtattgaa	aaaatgttagc	tccaaatgtt	gaagaaaatcg	tagtccaac	tgttgaagaa	360
attgtagctc	caagtgttgt	agaaaaagtgt	gcttcaagt	ttgaagaaaag	tgtagctcca	420
agtgttgaag	aaagtgttagc	tgaaaatgtt	aaggaaagga	attc		464

<210> 34

<211> 988

<212> DNA

<213> Plasmodium falciparum

<400> 34

aaagtataca	tcttccttct	ttacttctta	aaatgaaaca	tatttgtac	atatcatttt	60
actttatcct	tgttaattta	ttgatatttc	atataaatgg	aaagataata	aagaattctg	120
aaaaagatga	aatcataaaaa	tctaacttga	gaagtggttc	ttcaaattct	aggaatcgaa	180
taaatgagga	aatatcacgag	aagaaacacg	ttttatctca	taattcatat	gagaaaaacta	240
aaaataatga	aaataataaaa	tttttcgata	aggataaaaga	gttaacgtat	tctaatgtaa	300
aaaatgtgtc	acaaacaat	ttcaaaatgt	ttttaagaaa	tcttgggtt	tcagagaata	360
tattccattaa	aaaaaaataaa	ttaataaagg	aaggggaaatt	aattgaacac	ataataaatg	420
atgatgacga	taaaaaaaaaa	tatattaaag	ggcaagacga	aaacagacaa	gaagatctt	480
aagaaaaaagc	agctaaagaa	aagttacagg	ggcaacaaag	cgattcagaa	caagagagac	540
gtgctaaaga	aaagttgcaa	gaacaacaaa	gcgattttaga	acaagagaga	cttgctaaag	600
aaaagttgca	agaacaacaa	agcgatttag	aacaagagag	acgtctaaa	gaaaagttgc	660
aagaacaaca	aagcgattta	gaacaagaga	gacttgctaa	agaaaaagtt	caagaacaac	720
aaagcgattt	agaacaagag	agacgtgcta	aagaaaagtt	gcaagaacaa	caaagcgatt	780
tagaacaaga	gagacgtgct	aaagaaaaagt	tgcaagaaca	acaaagcgat	ttagaacaag	840
agagacttgc	taaagaaaaag	ttacaagagc	agcaaagcg	ttttagaacaa	gatagactt	900
ctaaagaaaa	gttgcagaaa	caacaaagcg	atttagaaca	agagagacgt	gctaaagaaa	960
ggttgcaga	acaacaaagcg	gatttaga				988

<210> 35

<211> 12

<212> DNA

<213> Plasmodium falciparum

<400> 35

atgaaacata tt

<210> 36  
<211> 12  
<212> DNA  
<213> Plasmodium falciparum

<400> 36  
aagcgattta ga

<210> 37  
<211> 954  
<212> DNA  
<213> Plasmodium falciparum

<220>  
<221> CDS  
<222> (1)..(954)

&lt;400&gt; 37

atg	aaa	cat	att	ttg	tac	ata	tca	ttt	tac	ttt	atc	ctt	gtt	aat	tta		48
Met	Lys	His	Ile	Leu	Tyr	Ile	Ser	Phe	Tyr	Phe	Ile	Leu	Val	Asn	Leu		
1			5					10						15			

ttg	ata	ttt	cat	ata	aat	gga	aag	ata	ata	aag	aat	tct	gaa	aaa	gat		96
Leu	Ile	Phe	His	Ile	Asn	Gly	Lys	Ile	Ile	Lys	Asn	Ser	Glu	Lys	Asp		
20					25							30					

gaa	atc	ata	aaa	tct	aac	ttg	aga	agt	ggt	tct	tca	aat	tct	agg	aat		144
Glu	Ile	Ile	Lys	Ser	Asn	Leu	Arg	Ser	Gly	Ser	Ser	Asn	Ser	Arg	Asn		
35					40						45						

cga	ata	aat	gag	gaa	aat	cac	gag	aag	aaa	cac	gtt	tta	tct	cat	aat		192
Arg	Ile	Asn	Glu	Glu	Asn	His	Glu	Lys	Lys	His	Val	Leu	Ser	His	Asn		
50					55						60						

tca	tat	gag	aaa	act	aaa	aat	aat	gaa	aat	aat	aaa	ttt	ttc	gat	aag		240
Ser	Tyr	Glu	Lys	Thr	Lys	Asn	Asn	Glu	Asn	Asn	Lys	Phe	Phe	Asp	Lys		
65					70						75				80		

gat	aaa	gag	tta	acg	atg	tct	aat	gta	aaa	aat	gtg	tca	caa	aca	aat		288
Asp	Lys	Glu	Leu	Thr	Met	Ser	Asn	Val	Lys	Asn	Val	Ser	Gln	Thr	Asn		
85						90						95					

ttc	aaa	agt	ctt	tta	aga	aat	ctt	ggg	gtt	tca	gag	aat	ata	ttc	ctt		336
Phe	Lys	Ser	Leu	Leu	Arg	Asn	Leu	Gly	Val	Ser	Glu	Asn	Ile	Phe	Leu		
100					105						110						

aaa	gaa	aat	aaa	tta	aat	aag	gaa	ggg	aaa	tta	att	gaa	cac	ata	ata		384
Lys	Glu	Asn	Lys	Leu	Asn	Lys	Glu	Gly	Lys	Leu	Ile	Glu	His	Ile	Ile		
115					120						125						

aat	gat	gat	gac	gat	aaa	aaa	aaa	tat	att	aaa	ggg	caa	gac	gaa	aac		432
Asn	Asp	Asp	Asp	Asp	Lys	Lys	Lys	Tyr	Ile	Lys	Gly	Gln	Asp	Glu	Asn		
130					135						140						

aga	caa	gaa	gat	ctt	gaa	gaa	aaa	gca	gct	aaa	gaa	aag	tta	cag	ggg		480
Arg	Gln	Glu	Asp	Leu	Glu	Glu	Lys	Ala	Ala	Lys	Glu	Lys	Leu	Gln	Gly		
145					150						155			160			

caa	caa	agc	gat	tca	gaa	caa	gag	aga	cgt	gct	aaa	gaa	aag	ttg	caa		528
Gln	Gln	Ser	Asp	Ser	Glu	Gln	Glu	Arg	Arg	Ala	Lys	Glu	Lys	Leu	Gln		
165										170				175			

10830118.txt

gaa caa caa agc gat tta gaa caa gag aga ctt gct aaa gaa aag ttg Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys Glu Lys Leu 180 185 190	576
caa gaa caa caa agc gat tta gaa caa gag aga cgt gct aaa gaa aag Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys 195 200 205	624
ttg caa gaa caa caa agc gat tta gaa caa gag aga ctt gct aaa gaa Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys Glu 210 215 220	672
aag ttg caa gaa caa caa agc gat tta gaa caa gag aga cgt gct aaa Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys 225 230 235 240	720
gaa aag ttg caa gaa caa caa agc gat tta gaa caa gag aga cgt gct Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala 245 250 255	768
aaa gaa aag ttg caa gaa caa caa agc gat tta gaa caa gag aga ctt Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu 260 265 270	816
gct aaa gaa aag tta caa gag cag caa agc gat tta gaa caa gag aga Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg 275 280 285	864
ctt gct aaa gaa aag ttg caa gaa caa caa agc gat tta gaa caa gag Leu Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu 290 295 300	912
aga cgt gct aaa gaa agg ttg caa gaa caa caa agc gat tta Arg Arg Ala Lys Glu Arg Leu Gln Glu Gln Gln Ser Asp Leu 305 310 315	954

<210> 38  
<211> 318  
<212> PRT  
<213> Plasmodium falciparum

<400> 38 Met Lys His Ile Leu Tyr Ile Ser Phe Tyr Phe Ile Leu Val Asn Leu 1 5 10 15
Leu Ile Phe His Ile Asn Gly Lys Ile Ile Lys Asn Ser Glu Lys Asp 20 25 30
Glu Ile Ile Lys Ser Asn Leu Arg Ser Gly Ser Ser Asn Ser Arg Asn 35 40 45
Arg Ile Asn Glu Glu Asn His Glu Lys Lys His Val Leu Ser His Asn 50 55 60
Ser Tyr Glu Lys Thr Lys Asn Asn Glu Asn Asn Lys Phe Phe Asp Lys 65 70 75 80
Asp Lys Glu Leu Thr Met Ser Asn Val Lys Asn Val Ser Gln Thr Asn 85 90 95

10830118.txt

Phe Lys Ser Leu Leu Arg Asn Leu Gly Val Ser Glu Asn Ile Phe Leu  
 100 105 110

Lys Glu Asn Lys Leu Asn Lys Glu Gly Lys Leu Ile Glu His Ile Ile  
 115 120 125

Asn Asp Asp Asp Asp Lys Lys Tyr Ile Lys Gly Gln Asp Glu Asn  
 130 135 140

Arg Gln Glu Asp Leu Glu Glu Lys Ala Ala Lys Glu Lys Leu Gln Gly  
 145 150 155 160

Gln Gln Ser Asp Ser Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln  
 165 170 175

Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys Glu Lys Leu  
 180 185 190

Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys  
 195 200 205

Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys Glu  
 210 215 220

Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys  
 225 230 235 240

Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala  
 245 250 255

Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu  
 260 265 270

Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg  
 275 280 285

Leu Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu  
 290 295 300

Arg Arg Ala Lys Glu Arg Leu Gln Glu Gln Gln Ser Asp Leu  
 305 310 315

<210> 39  
 <211> 1493  
 <212> DNA  
 <213> Plasmodium falciparum

<400> 39  
 caagaacaac aaagcgatct agaacaagag agacgtgcta aagaaaagt gcaagaacaa 60  
 ccaaaggcatt tagaacaaga tagacttgct aaagaaaaagt tacaagagca gcaaaggcat 120  
 tttagaacaag agagacttgc taagaaaaagt tgcaagaaca acaaaggcgat ctagaacaag 180  
 agagacgtgc taaagaaaaag ttgcaagaac aacaaaggcg tttagaacaa gagagacgtg 240  
 ctaaagaaaa gttgcaagaa caacaaaggcg atttagaaca agatagactt gctaaagaaa 300  
 agttacaaga gcagcaaagc gatttagaac aagagagacg tgctaaagaa aagttgcaag 360  
 aacaacaaag cgatttagaa caagagagac gtgctaagaa aagttgcaag aacaacaaag 420  
 cgatttagaa caagagagac ttgctaaaga aagttgcaaa gaacaacaaa gcgatttaga 480  
 acaagagaga cgtgctaaag aaaagttgca agaacaacaa agcgatttag aacaagagag 540  
 acgtgctaaag aaaagttgca agaacaacaa agcgatttag aacaagagag acgtgctaaa 600  
 gaaaagttgc aagagcagca aagagattta gaacaaagga aggtgtatac gaaaaaaaaat 660  
 tttagaaagaa aaaaaggaaaca tggagatata ttagcagagg atttatatgg tcgttttagaa 720  
 ataccagcta tagaacttcc atcagaaaaat gaacgtggat atttatatacc acatcaatct 780  
 tctttacctc aggacaacag agggaatagt agagattcca agggaaatatc tataatagaa 840

## 10830118.txt

aaaacaaata gagaatctat tacaacaaat gttgaaggac gaagggatat acataaaagga 900  
catcttgaag aaaagaaaaga tggttcaata aaaccagaac aaaaagaaga taaatctgct 960  
gacatacaa atcatacatt agagacagta aatattctg atgttaatgta ttttcaaata 1020  
agtaagtatg aggatgaaat aagtgcgtaa tatgacgatt cattaataga tgaagaagaa 1080  
gatgatgaag acttagacga atttaagcct atttgcaat atgacaattt ccaagatgaa 1140  
gaaaacatag gaatttataa agaactagaa gatttgatag agaaaaatga aaatttagat 1200  
gatttagatg aaggaataga aaaatcatca gaagaattat ctgaagaaaa aataaaaaaa 1260  
ggaaagaaat atgaaaaaac aaaggataat aattttaaac caaatgataa aagtttgtat 1320  
gatgacata ttaaaaaata taaaaatgat aagcaggtt ataaggaaaa ggaaaaattc 1380  
ataaaatcat ttttcataat atttgacgga gacaatgaaa ttttacagat cgtggatgag 1440  
ttatctgaag atataactaa atattttatg aaactataaa aggttatata ttt 1493

<210> 40  
<211> 12  
<212> DNA  
<213> Plasmodium falciparum

<400> 40  
caagaacaac aa 12

<210> 41  
<211> 12  
<212> DNA  
<213> Plasmodium falciparum

<400> 41  
ggttatatat tt 12

<210> 42  
<211> 1494  
<212> DNA  
<213> Plasmodium falciparum

<220>  
<221> CDS  
<222> (1)..(1494)

<400> 42  
caa gaa caa caa agc gat cta gaa caa gag aga cgt gct aaa gaa aag 48  
Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys  
1 5 10 15

ttg caa gaa caa caa agc gat tta gaa caa gat aga ctt gct aaa gaa 96  
Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg Leu Ala Lys Glu  
20 25 30

aag tta caa gag cag caa agc gat tta gaa caa gag aga ctt gct aaa 144  
Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys  
35 40 45

gaa aag ttg caa gaa caa caa agc gat cta gaa caa gag aga cgt gct 192  
Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala  
50 55 60

aaa gaa aag ttg caa gaa caa caa agc gat tta gaa caa gag aga cgt 240  
Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg  
65 70 75 80

gct aaa gaa aag ttg caa gaa caa caa agc gat tta gaa caa gag aga 288  
Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg  
85 90 95

ctt gct aaa gaa aag tta caa gag cag caa agc gat tta gaa caa gag 336  
Page 20

10830118.txt

Leu	Ala	Lys	Glu	Lys	Leu	Gln	Glu	Gln	Gln	Ser	Asp	Leu	Glu	Gln	Glu	
100					105							110				
aga	cgt	gct	aaa	gaa	aag	ttg	caa	gaa	caa	caa	agc	gat	tta	gaa	caa	384
Arg	Arg	Ala	Lys	Glu	Lys	Leu	Gln	Glu	Gln	Gln	Ser	Asp	Leu	Glu	Gln	
115					120							125				
gag	aga	cgt	gct	aaa	gaa	aag	ttg	caa	gaa	caa	caa	agc	gat	tta	gaa	432
Glu	Arg	Arg	Ala	Lys	Glu	Lys	Leu	Gln	Glu	Gln	Gln	Ser	Asp	Leu	Glu	
130					135							140				
caa	gag	aga	ctt	gct	aaa	gaa	aag	ttg	caa	gaa	caa	caa	agc	gat	tta	480
Gln	Glu	Arg	Leu	Ala	Lys	Glu	Lys	Leu	Gln	Glu	Gln	Gln	Ser	Asp	Leu	
145					150				155						160	
gaa	caa	gag	aga	cgt	gct	aaa	gaa	aag	ttg	caa	gaa	caa	caa	agc	gat	528
Glu	Gln	Glu	Arg	Arg	Ala	Lys	Glu	Lys	Leu	Gln	Glu	Gln	Gln	Ser	Asp	
165								170							175	
tta	gaa	caa	gag	aga	cgt	gct	aaa	gaa	aag	ttg	caa	gaa	caa	caa	agc	576
Leu	Glu	Gln	Glu	Arg	Arg	Ala	Lys	Glu	Lys	Leu	Gln	Glu	Gln	Gln	Ser	
180						185									190	
gat	tta	gaa	caa	gag	aga	cgt	gct	aaa	gaa	aag	ttg	caa	gag	cag	caa	624
Asp	Leu	Glu	Gln	Glu	Arg	Arg	Ala	Lys	Glu	Lys	Leu	Gln	Glu	Gln	Gln	
195						200					205					
aga	gat	tta	gaa	caa	agg	aag	gct	gat	acg	aaa	aaa	aat	tta	gaa	aga	672
Arg	Asp	Leu	Glu	Gln	Arg	Lys	Ala	Asp	Thr	Lys	Lys	Asn	Leu	Glu	Arg	
210						215				220						
aaa	aag	gaa	cat	gga	gat	ata	tta	gca	gag	gat	tta	tat	ggt	cgt	tta	720
Lys	Lys	Glu	His	Gly	Asp	Ile	Leu	Ala	Glu	Asp	Leu	Tyr	Gly	Arg	Leu	
225						230				235					240	
gaa	ata	cca	gct	ata	gaa	ctt	cca	tca	gaa	aat	gaa	cgt	gga	tat	tat	768
Glu	Ile	Pro	Ala	Ile	Glu	Leu	Pro	Ser	Glu	Asn	Glu	Arg	Gly	Tyr	Tyr	
245								250							255	
ata	cca	cat	caa	tct	tct	tta	cct	cag	gac	aac	aga	ggg	aat	agt	aga	816
Ile	Pro	His	Gln	Ser	Ser	Leu	Pro	Gln	Asp	Asn	Arg	Gly	Asn	Ser	Arg	
260								265							270	
gat	tcc	aag	gaa	ata	tct	ata	ata	gaa	aaa	aca	aat	aga	gaa	tct	att	864
Asp	Ser	Lys	Glu	Ile	Ser	Ile	Ile	Glu	Lys	Thr	Asn	Arg	Glu	Ser	Ile	
275							280					285				
aca	aca	aat	gtt	gaa	gga	cga	agg	gat	ata	cat	aaa	gga	cat	ctt	gaa	912
Thr	Thr	Asn	Val	Glu	Gly	Arg	Arg	Asp	Ile	His	Lys	Gly	His	Leu	Glu	
290						295				300						
gaa	aag	aaa	gat	ggt	tca	ata	aaa	cca	gaa	caa	aaa	gaa	gat	aaa	tct	960
Glu	Lys	Lys	Asp	Gly	Ser	Ile	Lys	Pro	Glu	Gln	Lys	Glu	Asp	Lys	Ser	
305						310				315					320	
gct	gac	ata	caa	aat	cat	aca	tta	gag	aca	gta	aat	att	tct	gat	gtt	1008
Ala	Asp	Ile	Gln	Asn	His	Thr	Leu	Glu	Thr	Val	Asn	Ile	Ser	Asp	Val	
325								330							335	
aat	gat	ttt	caa	ata	agt	aag	tat	gag	gat	gaa	ata	agt	gct	gaa	tat	1056
Asn	Asp	Phe	Gln	Ile	Ser	Lys	Tyr	Glu	Asp	Glu	Ile	Ser	Ala	Glu	Tyr	
340							345						350			

10830118.txt

gac gat tca tta ata gat gaa gaa gaa gat gat gaa gac tta gac gaa Asp Asp Ser Leu Ile Asp Glu Glu Glu Asp Asp Glu Asp Leu Asp Glu 355 360 365	1104
ttt aag cct att gtq caa tat gac aat ttc caa gat gaa gaa aac ata Phe Lys Pro Ile Val Gln Tyr Asp Asn Phe Gln Asp Glu Glu Asn Ile 370 375 380	1152
gga att tat aaa gaa cta gaa gat ttg ata gag aaa aat gaa aat tta Gly Ile Tyr Lys Glu Leu Glu Asp Leu Ile Glu Lys Asn Glu Asn Leu 385 390 395 400	1200
gat gat tta gat gaa gga ata gaa aaa tca tca gaa gaa tta tct gaa Asp Asp Leu Asp Glu Gly Ile Glu Lys Ser Ser Glu Glu Leu Ser Glu 405 410 415	1248
gaa aaa ata aaa aaa gga aag aaa tat gaa aaa aca aag gat aat aat Glu Lys Ile Lys Lys Gly Lys Lys Tyr Glu Lys Thr Lys Asp Asn Asn 420 425 430	1296
ttt aaa cca aat gat aaa agt ttg tat gat gag cat att aaa aaa tat Phe Lys Pro Asn Asp Lys Ser Leu Tyr Asp Glu His Ile Lys Lys Tyr 435 440 445	1344
aaa aat gat aag cag gtt aat aag gaa aag gaa aaa ttc ata aaa tca Lys Asn Asp Lys Gln Val Asn Lys Glu Lys Glu Lys Phe Ile Lys Ser 450 455 460	1392
ttg ttt cat ata ttt gac gga gac aat gaa att tta cag atc gtg gat Leu Phe His Ile Phe Asp Gly Asp Asn Glu Ile Leu Gln Ile Val Asp 465 470 475 480	1440
gag tta tct gaa gat ata act aaa tat ttt atg aaa cta taa aag gtt Glu Leu Ser Glu Asp Ile Thr Lys Tyr Phe Met Lys Leu 485 490	1488
ata tat	1494

<210> 43  
<211> 493  
<212> PRT  
<213> Plasmodium falciparum

<400> 43  
Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys  
1 5 10 15  
Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg Leu Ala Lys Glu  
20 25 30  
Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys  
35 40 45  
Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala  
50 55 60  
Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg  
65 70 75 80  
Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg  
85 90 95

10830118.txt

Leu Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu  
100 105 110  
Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln  
115 120 125  
Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu  
130 135 140  
Gln Glu Arg Leu Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu  
145 150 155 160  
Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp  
165 170 175  
Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser  
180 185 190  
Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln  
195 200 205  
Arg Asp Leu Glu Gln Arg Lys Ala Asp Thr Lys Lys Asn Leu Glu Arg  
210 215 220  
Lys Lys Glu His Gly Asp Ile Leu Ala Glu Asp Leu Tyr Gly Arg Leu  
225 230 235 240  
Glu Ile Pro Ala Ile Glu Leu Pro Ser Glu Asn Glu Arg Gly Tyr Tyr  
245 250 255  
Ile Pro His Gln Ser Ser Leu Pro Gln Asp Asn Arg Gly Asn Ser Arg  
260 265 270  
Asp Ser Lys Glu Ile Ser Ile Ile Glu Lys Thr Asn Arg Glu Ser Ile  
275 280 285  
Thr Thr Asn Val Glu Gly Arg Arg Asp Ile His Lys Gly His Leu Glu  
290 295 300  
Glu Lys Lys Asp Gly Ser Ile Lys Pro Glu Gln Lys Glu Asp Lys Ser  
305 310 315 320  
Ala Asp Ile Gln Asn His Thr Leu Glu Thr Val Asn Ile Ser Asp Val  
325 330 335  
Asn Asp Phe Gln Ile Ser Lys Tyr Glu Asp Glu Ile Ser Ala Glu Tyr  
340 345 350  
Asp Asp Ser Leu Ile Asp Glu Glu Glu Asp Asp Glu Asp Leu Asp Glu  
355 360 365  
Phe Lys Pro Ile Val Gln Tyr Asp Asn Phe Gln Asp Glu Glu Asn Ile  
370 375 380  
Gly Ile Tyr Lys Glu Leu Glu Asp Leu Ile Glu Lys Asn Glu Asn Leu  
385 390 395 400  
Asp Asp Leu Asp Glu Gly Ile Glu Lys Ser Ser Glu Glu Leu Ser Glu  
405 410 415  
Glu Lys Ile Lys Lys Gly Lys Lys Tyr Glu Lys Thr Lys Asp Asn Asn  
420 425 430

10830118.txt

Phe Lys Pro Asn Asp Lys Ser Leu Tyr Asp Glu His Ile Lys Lys Tyr  
 435 440 445

Lys Asn Asp Lys Gln Val Asn Lys Glu Lys Glu Lys Phe Ile Lys Ser  
 450 455 460

Leu Phe His Ile Phe Asp Gly Asp Asn Glu Ile Leu Gln Ile Val Asp  
 465 470 475 480

Glu Leu Ser Glu Asp Ile Thr Lys Tyr Phe Met Lys Leu  
 485 490

<210> 44  
 <211> 12  
 <212> DNA  
 <213> Plasmodium falciparum

<400> 44  
 caagaacaac aa

12

<210> 45  
 <211> 12  
 <212> DNA  
 <213> Plasmodium falciparum

<400> 45  
 atgaaactat aa

12

<210> 46  
 <211> 1494  
 <212> DNA  
 <213> Plasmodium falciparum

<220>  
 <221> CDS  
 <222> (1)..(1494)

<400> 46  
 caa gaa caa caa agc gat cta gaa caa gag aga cgt gct aaa gaa aag 48  
 Gln Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys  
 1 5 10 15

ttg caa gaa caa caa agc gat tta gaa caa gat aga ctt gct aaa gaa 96  
 Leu Gln Glu Gln Ser Asp Leu Glu Gln Asp Arg Leu Ala Lys Glu  
 20 25 30

aag tta caa gag cag caa agc gat tta gaa caa gag aga ctt gct aaa 144  
 Lys Leu Gln Glu Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys  
 35 40 45

gaa aag ttg caa gaa caa caa agc gat cta gaa caa gag aga cgt gct 192  
 Glu Lys Leu Gln Glu Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala  
 50 55 60

aaa gaa aag ttg caa gaa caa caa agc gat tta gaa caa gag aga cgt 240  
 Lys Glu Lys Leu Gln Glu Gln Ser Asp Leu Glu Gln Glu Arg Arg  
 65 70 75 80

gct aaa gaa aag ttg caa gaa caa caa agc gat tta gaa caa gat aga 288  
 Ala Lys Glu Lys Leu Gln Glu Gln Ser Asp Leu Glu Gln Asp Arg  
 85 90 95

10830118.txt

ctt gct aaa gaa aag tta caa gag cag caa agc gat tta gaa caa gag Leu Ala Lys Glu Lys Leu Gln Glu Gln Ser Asp Leu Glu Gln Glu 100 105 110	336
aga cgt gct aaa gaa aag ttg caa gaa caa caa agc gat tta gaa caa Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Ser Asp Leu Glu Gln 115 120 125	384
gag aga cgt gct aaa gaa aag ttg caa gaa caa caa agc gat tta gaa Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Ser Asp Leu Glu 130 135 140	432
caa gag aga ctt gct aaa gaa aag ttg caa gaa caa caa agc gat tta Gln Glu Arg Leu Ala Lys Glu Lys Leu Gln Glu Gln Ser Asp Leu 145 150 155 160	480
gaa caa gag aga cgt gct aaa gaa aag ttg caa gaa caa caa agc gat Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp 165 170 175	528
tta gaa caa gag aga cgt gct aaa gaa aag ttg caa gaa caa caa caa agc Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser 180 185 190	576
gat tta gaa caa gag aga cgt gct aaa gaa aag ttg caa gag cag caa Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln 195 200 205	624
aga gat tta gaa caa agg aag gct gat acg aaa aat tta gaa aga Arg Asp Leu Glu Gln Arg Lys Ala Asp Thr Lys Lys Asn Leu Glu Arg 210 215 220	672
aaa aag gaa cat gga gat ata tta gca gag gat tta tat ggt cgt tta Lys Lys Glu His Gly Asp Ile Leu Ala Glu Asp Leu Tyr Gly Arg Leu 225 230 235 240	720
gaa ata cca gct ata gaa ctt cca tca gaa aat gaa cgt gga tat tat Glu Ile Pro Ala Ile Glu Leu Pro Ser Glu Asn Glu Arg Gly Tyr Tyr 245 250 255	768
ata cca cat caa tct tct tta cct cag gac aac aga ggg aat agt aga Ile Pro His Gln Ser Ser Leu Pro Gln Asp Asn Arg Gly Asn Ser Arg 260 265 270	816
gat tcc aag gaa ata tct ata ata gaa aaa aca aat aga gaa tct att Asp Ser Lys Glu Ile Ser Ile Ile Glu Lys Thr Asn Arg Glu Ser Ile 275 280 285	864
aca aca aat gtt gaa gga cga agg gat ata cat aaa gga cat ctt gaa Thr Thr Asn Val Glu Gly Arg Arg Asp Ile His Lys Gly His Leu Glu 290 295 300	912
gaa aag aaa gat ggt tca ata aaa cca gaa caa aaa gaa gat aaa tct Glu Lys Lys Asp Gly Ser Ile Lys Pro Glu Gln Lys Glu Asp Lys Ser 305 310 315 320	960
gct gac ata caa aat cat aca tta gag aca gta aat att tct gat gtt Ala Asp Ile Gln Asn His Thr Leu Glu Thr Val Asn Ile Ser Asp Val 325 330 335	1008
aat gat ttt caa ata agt aag tat gag gat gaa ata agt gct gaa tat Asn Asp Phe Gln Ile Ser Lys Tyr Glu Asp Glu Ile Ser Ala Glu Tyr	1056

## 10830118.txt

340

345

350

gac gat tca tta ata gat gaa gaa gaa gat gat gaa gac tta gac gaa Asp Asp Ser Leu Ile Asp Glu Glu Glu Asp Asp Glu Asp Leu Asp Glu 355 360 365	1104
ttt aag cct att gtg caa tat gac aat ttc caa gat gaa gaa aac ata Phe Lys Pro Ile Val Gln Tyr Asp Asn Phe Gln Asp Glu Glu Asn Ile 370 375 380	1152
gga att tat aaa gaa cta gaa gat ttg ata gag aaa aat gaa aat tta Gly Ile Tyr Lys Glu Leu Glu Asp Leu Ile Glu Lys Asn Glu Asn Leu 385 390 395 400	1200
gat gat tta gat gaa gga ata gaa aaa tca tca gaa gaa tta tct gaa Asp Asp Leu Asp Glu Gly Ile Glu Lys Ser Ser Glu Glu Leu Ser Glu 405 410 415	1248
gaa aaa ata aaa aaa gga aag aaa tat gaa aaa aca aag gat aat aat Glu Lys Ile Lys Lys Gly Lys Lys Tyr Glu Lys Thr Lys Asp Asn Asn 420 425 430	1296
ttt aaa cca aat gat aaa agt ttg tat gat gag cat att aaa aaa tat Phe Lys Pro Asn Asp Lys Ser Leu Tyr Asp Glu His Ile Lys Lys Tyr 435 440 445	1344
aaa aat gat aag cag gtt aat aag gaa aag gaa aaa ttc ata aaa tca Lys Asn Asp Lys Gln Val Asn Lys Glu Lys Glu Lys Phe Ile Lys Ser 450 455 460	1392
ttg ttt cat ata ttt gac gga gac aat gaa att tta cag atc gtg gat Leu Phe His Ile Phe Asp Gly Asp Asn Glu Ile Leu Gln Ile Val Asp 465 470 475 480	1440
gag tta tct gaa gat ata act aaa tat ttt atg aaa cta taa aag gtt Glu Leu Ser Glu Asp Ile Thr Lys Tyr Phe Met Lys Leu 485 490	1488
ata tat	1494

<210> 47  
<211> 493  
<212> PRT  
<213> Plasmodium falciparum

<400> 47  
Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys  
1 5 10 15  
Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg Leu Ala Lys Glu  
20 25 30  
Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys  
35 40 45  
Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala  
50 55 60  
Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg  
65 70 75 80  
Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg

## 10830118.txt

85

90

95

Leu Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu  
 100 105 110  
 Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln  
 115 120 125  
 Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu  
 130 135 140  
 Gln Glu Arg Leu Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu  
 145 150 155 160  
 Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp  
 165 170 175  
 Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser  
 180 185 190  
 Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln  
 195 200 205  
 Arg Asp Leu Glu Gln Arg Lys Ala Asp Thr Lys Lys Asn Leu Glu Arg  
 210 215 220  
 Lys Lys Glu His Gly Asp Ile Leu Ala Glu Asp Leu Tyr Gly Arg Leu  
 225 230 235 240  
 Glu Ile Pro Ala Ile Glu Leu Pro Ser Glu Asn Glu Arg Gly Tyr Tyr  
 245 250 255  
 Ile Pro His Gln Ser Ser Leu Pro Gln Asp Asn Arg Gly Asn Ser Arg  
 260 265 270  
 Asp Ser Lys Glu Ile Ser Ile Ile Glu Lys Thr Asn Arg Glu Ser Ile  
 275 280 285  
 Thr Thr Asn Val Glu Gly Arg Arg Asp Ile His Lys Gly His Leu Glu  
 290 295 300  
 Glu Lys Lys Asp Gly Ser Ile Lys Pro Glu Gln Lys Glu Asp Lys Ser  
 305 310 315 320  
 Ala Asp Ile Gln Asn His Thr Leu Glu Thr Val Asn Ile Ser Asp Val  
 325 330 335  
 Asn Asp Phe Gln Ile Ser Lys Tyr Glu Asp Glu Ile Ser Ala Glu Tyr  
 340 345 350  
 Asp Asp Ser Leu Ile Asp Glu Glu Asp Asp Glu Asp Leu Asp Glu  
 355 360 365  
 Phe Lys Pro Ile Val Gln Tyr Asp Asn Phe Gln Asp Glu Glu Asn Ile  
 370 375 380  
 Gly Ile Tyr Lys Glu Leu Glu Asp Leu Ile Glu Lys Asn Glu Asn Leu  
 385 390 395 400  
 Asp Asp Leu Asp Glu Gly Ile Glu Lys Ser Ser Glu Glu Leu Ser Glu  
 405 410 415  
 Glu Lys Ile Lys Lys Gly Lys Lys Tyr Glu Lys Thr Lys Asp Asn Asn

10830118.txt

420	425	430
Phe Lys Pro Asn Asp Lys Ser Leu Tyr Asp Glu His Ile Lys Lys Tyr		
435	440	445
Lys Asn Asp Lys Gln Val Asn Lys Glu Lys Glu Lys Phe Ile Lys Ser		
450	455	460
Leu Phe His Ile Phe Asp Gly Asp Asn Glu Ile Leu Gln Ile Val Asp		
465	470	475
Glu Leu Ser Glu Asp Ile Thr Lys Tyr Phe Met Lys Leu		
485	490	480